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A GUIDE FOR POLICYMAKERS. REPORT A--EDUCATIONAL FACILITIES WITH NEW MEDIA.

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THE CONTENTS OF THIS REPORT PROVIDED GUIDELINES FOR PLANNING SCHOOL FACILITIES AND FOR MAKING DECISIONS ON ARCHITECTURAL MATTERS. IT IS DIRECTED PRIMARILY TO BOARDS, ADMINISTRATORS, PLANNING COMMITTEES, AND INSTITUTIONAL PLANNERS. DATA, DESIGN STUDIES, PREMISES, REACTIONS, AND CONCLUSIONS WERE COLLECTED AND ORGANIZED. THIS REPORT PROVIDES (1) DEFINITION AND REVIEW OF THE LEARNING MEDIA, (2) DISCUSSION OF CONCERNS, DIRECTIONS, AND INNOVATIONS, AND (3) PROGRAMING AND TRANSLATION OF NEEDS INTO A FACILITY. THIS IS THE FIRST REPORT OF A SERIES OF THREE. ED 003 131, ED 003 132, AND ED 003 133. (RS)

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REPORT A

A GUIDE FOR POLICY MAKERS

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EDUCATIONAL FACILITIES WITH NEW MEDIA.
REPORT A: A Guide for Policy Makers

The final report of an architectural research study conducted by the staff of the Center for Architectural Research, School of Architecture, Rensselaer Polytechnic Institute, Troy, New York, under the terms of contract number OE-316-031 between Rensselaer and the United States Office of Education.

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December 1965

INTRODUCTION

A report of architectural research

This report is one of a series of three resulting from a two year architectural research study funded by Title VII – Part B (Dissemination) of the National Defense Education Act administered by the U. S. Office of Education.

Three reports

This series of reports is directed at one objective – optimizing the conditions for learning by providing the environments most conducive to learning when learning media are employed in the educational process. Toward meeting this objective, a body of material–data, design studies, premises, reactions, and conclusions–has been collected and organized to offer guidance in the programming and planning of the appropriate educational facilities. Since a number of different types of persons are involved in providing the educational environment, this guidance is offered in the three reports, each directed to somewhat different, but overlapping, audiences.

Three different audiences

The series has been given the overall title Educational Facilities with New Media. Within this series, Report A–"A Guide for Policy Makers" is directed primarily to boards, administrators, planning committees, and institutional planners; Report B–"A Guide for the Design Professions" is directed to architects, planners and design specialists, as well as planning committees; and Report C–"A Technical Guide" is intended for those concerned with details of design, architects, engineers, equipment and furniture suppliers, and media specialists.

In preparing three reports instead of one, some duplication and overlap among them is unavoidable. However, the content and the manner of presentation of each report have been chosen with these three audiences in mind.

INTRODUCTION

Points of explanation

To introduce these reports, several points of explanation should prevent the reader from moving into the reports with false notions as to content and purpose:

1. The primary concern is with creating the environments for learning–with planning space and designing educational facilities. More might be said about staff organization, curriculum, teachers, resources, and finances, but this is essentially an architectural research report, and these areas are considered only as they affect school planning.

Not evaluating educational philosophies

2. In dealing with school planning, educational philosophies which serve as the basis for planning cannot be avoided. However, evaluations and judgments as to the relative merits of such philosophies have been avoided as being outside the province of the study. Rather than "here is the way to educate and therefore provide these facilities", the approach has been "if you adopt this philosophy, these are the implications for facilities".

Specifically examing media and facilities

3. Learning media are only part of the current educational scene, and a look at facilities with learning media is <u>not</u> a comprehensive look at all educational facilities. However, there are occasions when examining one aspect of the total system in depth is valid. Emphasis is intentionally on learning media, and their implications for facilities.

Provide guidance to those responsible

Within this framework, it is hoped that the contents of these reports will help guide those persons responsible for providing todays school buildings toward sound educational and architectural decisions.

Contents of this report

Part 1 of this Report A defines the learning media and reviews their development and role in education. Parts 2 and 3 provide a broad review of contemporary education by discussing current concerns, general directions, and significant responses in the form of innovations. This sets the stage for more detailed discussion of learning media; Part 4 deals with current status and trends and Part 5 with general implications for planning. Part 6 discusses programming, the process which translates educational needs into a definition of the building.

The Appendix contains a synopsis of a series of seminars held during the project–"Three Meetings in May" and a review of educational innovation.

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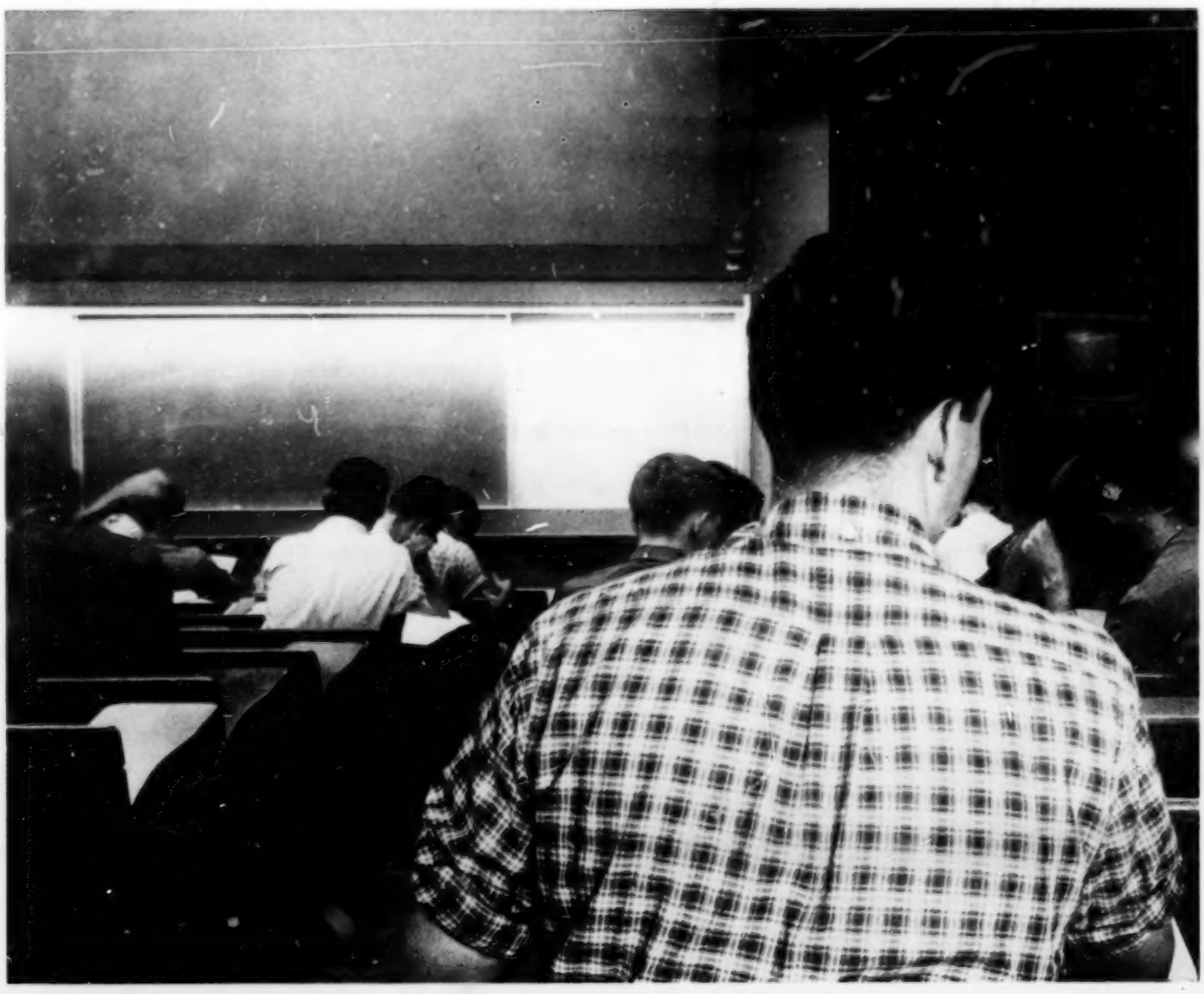

1 LEARNING MEDIA: AN OVERVIEW

Education is many things

Education today is many things–it is nongradedness and team teaching; it is modern math and programmed instruction; it is educational parks and schools–within–schools; it is computer–based scheduling and it is learning media.

Learning media defined

Learning media are devices or methods of varying sophistication which are utilized for organizing, presenting and storing information, and for encouraging appropriate learning responses. Media are systems of communication, or aids in the communicative process. Learning media, in the broadest sense, include the teacher, the book, and the chalkboard, as well as television, motion pictures and slides. This suggests that there can be two classifications,–conventional learning media and new learning media. This report is principally concerned with the latter.

Several concepts of media

There are several concepts of what constitutes learning media. "You can use (the term) to mean anything which is intermediary in getting across an idea, or you can use it as meaning anything which is intermediary in bringing the teacher to the student, and these are two different things."* 7

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*The quotations scattered through the report result from three invitational seminars held by the project staff. A summary of "Three Meetings in May" together with the list of participants is included in the appendix. The sources of the quotations are keyed to that list.

1/OVERVIEW

Here media are all these

Not wishing to belabor definitions, but desiring only to establish scope, this report deals with media in all these ways insofar as they affect space. Naturally more emphasis is placed on the newer media.

Historic development of media

The rapid expansion and development of learning media has been a phenomenon of this century, and the second world war can be identified as the major impetus. During the war, films, film strips, slides and records were perfected for helping to train the required civilian and military personnel. To these were added the opaque and overhead projector, and further refinements in film projectors in the period following the war. The 1950's brought the major development of television for education and more recently we have seen the growing use of programmed instruction and electronic-based information retrieval and data processing systems.

Maybe too many things to choose

From the listing of current media, one conclusion is evident; the educator has many--maybe too many--alternatives available as he structures learning situation with media.

LEARNING MEDIA -- MATERIALS AND METHODS

visual display

projected------8, 16, 35mm motion pictures
slides, 2"x2" to 3 1/4" x 4"
film strips
overhead transparencies
opaque materials
stereos of 3-d objects

non-projected--chalkboard surfaces
charts, illustrations, graphics
printed materials

audio presentation

recorded--records and tapes
telephone
broadcast radio
systems for sound distribution

three-dimensional

models, demonstrations, miniaturized materials

combined audio-video

sound motion pictures
sound slides
printed materials with recorded sound
kits of audio-video materials

television

broadcast and closed-circuit
live and recorded
reception by monitors, receivers, or projector

programmed instruction

visual display and texts
audio presentation
combined audio-video presentation

information systems

film-recorded
computer-based

Media used to increase efficiency and effectiveness

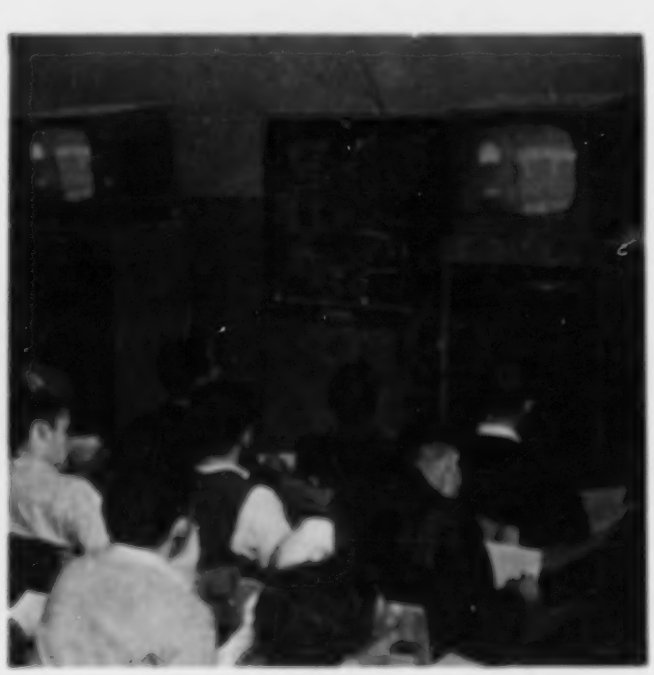
Media have been used in education for two purposes--to increase both the efficiency and effectiveness of education. The book increased efficiency by making information available to more people economically; the chalkboard made classroom instruction more effective; and the training developments of the World War were certainly geared to efficiency. The current boom in learning media, supported by federal, state, foundation, and industrial programs, continues to be directed to increasing efficiency and effectiveness.

Media has always affected school design....

The use of learning media in the educational process has always had an effect on the design of school buildings. The introduction of chalkboards into a classroom required appropriate viewing conditions and lighting; planning was often done carelessly and often not consciously, and the results were many inferior classrooms. The advent of slides and films required that a screen be introduced into the room, that a projector be positioned and powered, and that natural light be controlled by drapes or blinds. At that stage the use of projected media was a periodic event and the provision of one or two special rooms in a school–the audio visual room–was a relatively satisfactory solution for such infrequent uses.

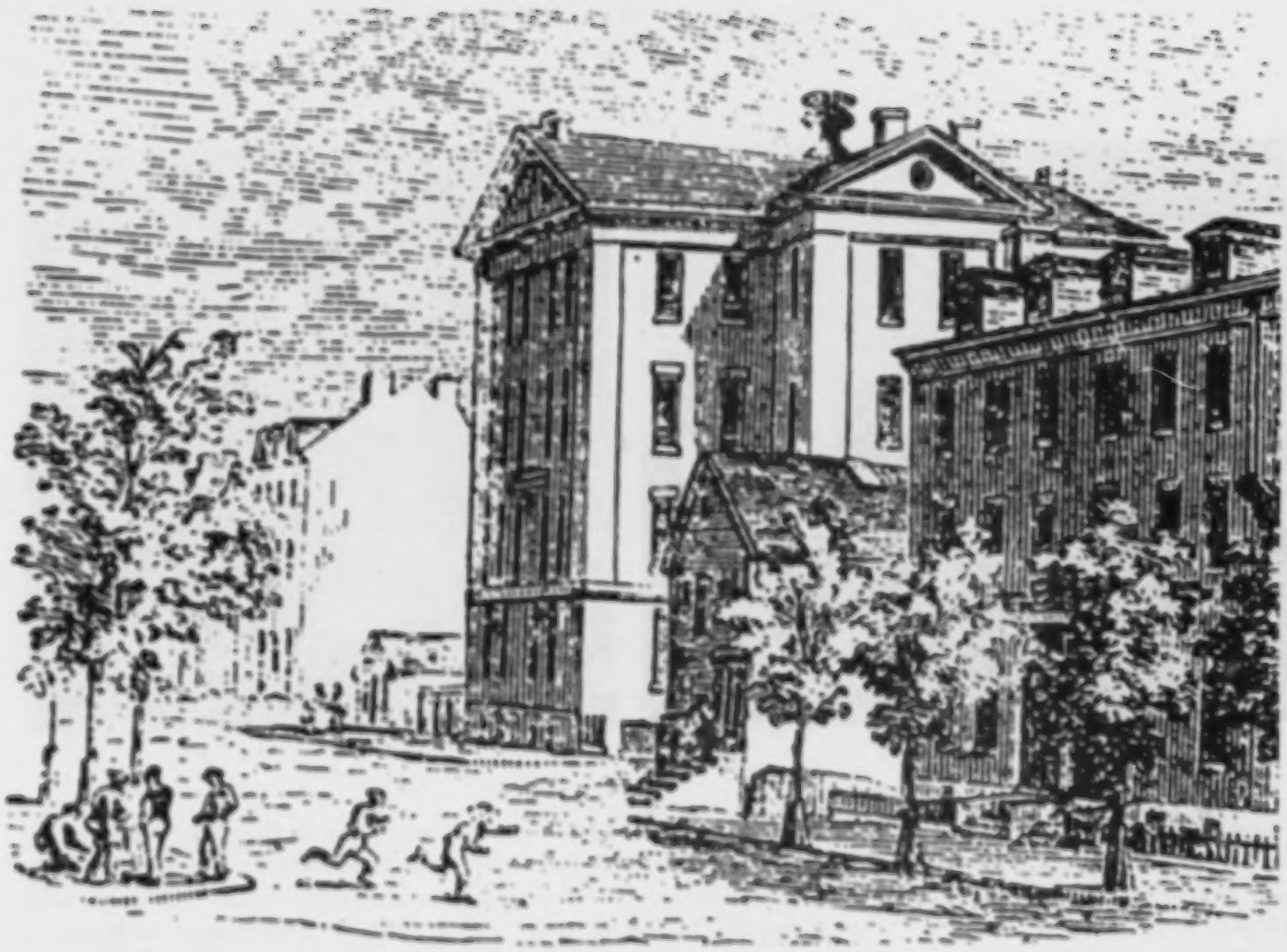
...but now to a greater degree

Learning media are now far more a part of the fabric of education, and may be employed everytime a class meets. With their increased use, and the expanded range and sophistication of methods, the concerns that media impose on educational facilities are far more extensive and significant than ever before. In fact, as this report emphasizes, the optimum utilization of learning media requires conscious planning efforts and the development of new design concepts in educational facilities.



To understand facilities, we must first review educational climate

To understand the nature of the facilities required for appropriate utilization of media requires that we first explore the contemporary educational climate–its problems and directions–and the responses being made in the form of innovations in educational techniques, organization, and methods. As learning media are part of these innovations, such a review will spell out their current role, and will identify their implications for facilities and architectural programming.



2 CONTEMPORARY EDUCATION: CONCERNS AND DIRECTIONS

Education can be characterized very differently

American education today is characterized in very different terms, depending on the individual being questioned and his background. For some it is a period of excitement and dramatic change, while for others it is a period of disenchantment with the past and pessimism regarding the future. Some persons see little evidence of educational development in proportion to other areas of society, while others are concerned by the swiftness and magnitude of change in education.

Generally, a lack of consistency

American education is, in fact, characterized by a lack of consistency. There is change, but the quality, magnitude, and direction of the change vary a great deal from region to region, from district to district, and from school to school. Financial support, breadth of opportunities and quality of program also vary widely; in some places, change is a mere ripple, while in others it is a great wave.

Forces exerted on education

However, there are some forces being exerted on each part of the educational system. The magnitude and direction of the forces vary, but always the origins are in one or a combination of concerns which face, or need to be faced by every board, administrator, teacher and taxpayer in the country. These concerns can be identified in terms of NUMBERS, KNOWLEDGE, SOCIETY, and MONEY.

First Concern: NUMBERS

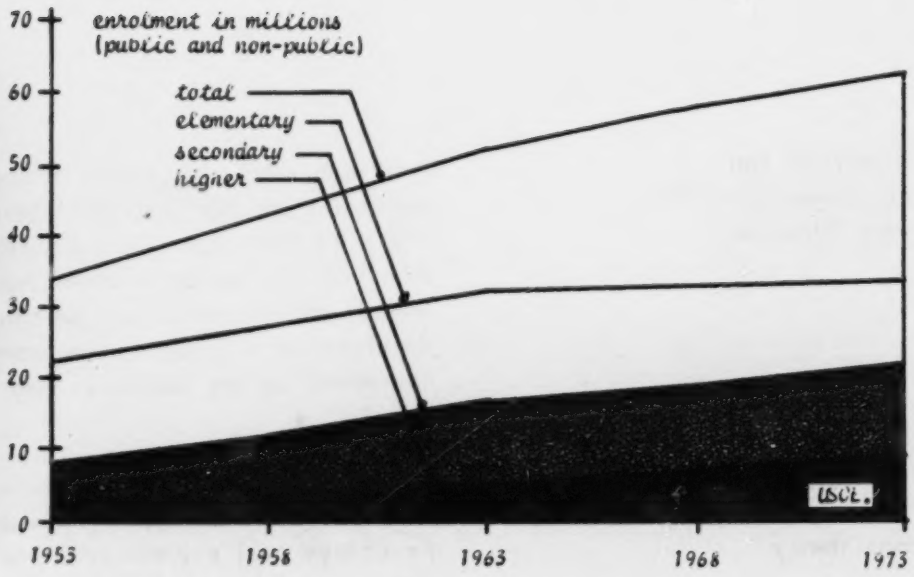
More persons now, and...

...in the future

- With an increasing population there are more students to attend our schools and colleges than ever before, and more significantly, a larger percentage of this population is attending school than before. Not only are there more children, but more persons of all ages are continuing through higher education and beyond. The future indicates still greater numbers.

2/CONCERNS AND DIRECTIONS

"If we try to look ahead 10 or 15 years, considering the present acceleration of change in education, it seems clear that by 1970 or 1975, people will have accepted the idea of a continuous school, not only in terms of a nongraded school, but a school that runs all year round, the way a post office or a supermarket does. They will not go through school—they'll go to school. They'll start earlier and will finish later. They'll go whenever they're ready, and they will have guidance available that fits their age and stage of development."3



Lack of teachers

- Classroom teachers seem to be in short supply (although there is debate on this point) and highly experienced, highly qualified teachers are rare (there is no debate on this). The supply of good teachers has not kept up with the demands for their services, and the rewards to the teaching profession have not been commensurate with its significance in society.

Shortage of buildings

- The construction of school buildings has not kept pace with the demands for additional space, not to mention keeping up with the need for replacement of obsolete facilities. Our more stable urban centers generally have sufficient schools, but of poor quality. Our suburban, fast-growing areas are simply short of school buildings of any type.

Size of the educational industry

- It's been noted that education is fast becoming the country's "largest industry." With bigness come not only opportunities for greatness, but also opportunities for ineptness, sluggishness, and resistance to change.

Second Concern: KNOWLEDGE

More knowledge accumulating faster

- We know more about more things today than we ever knew before, and we are accumulating this knowledge at a far faster rate than we ever have in the past.

Specialization of knowledge

- With such a body of knowledge accumulating at such a rapid rate, no one can be universally educated. Generally, to find one's role in life requires accumulation of specialized knowledge in one particular area.

Third Concern: SOCIETY

Education for survival

- Education is becoming associated with national survival—social and cultural as well as physical. Where once people were passive about education, they are now alert to its role in society. Or to put it another way, "The school is the institution in which democracy has the best chance of becoming conscious of itself. The fundamental problem is one of developing the kind of institution that combines the degree of individual freedom and initiative which is necessary for progress, with the degree of social cohesion that is necessary for survival."1

World-wide Influences

- Educational concerns are no longer confined to the community or even to the nation. Education is one means being employed to assert the world's undeveloped and developing areas. In fact, after freedom, it is the primary need of society in the contemporary world.

Effects of automation and technology

- The talents of many men are in competition with the capabilities of new machines and the techniques of automation. A man's skills, his training and education, and hence his livelihood, may become obsolete during his lifetime. Society demands that education provide job training as well as a means of fulfullment during expanded leisure.

Education for self-fulfillment

- "I predict that within the next 25 to 50 years maybe 20% of the people are going to be able to do all the work that's needed, which means we'll have on the one hand this rapid explosion of knowledge, and on the other hand, the elimination of a lot of work. So I think that we are going to have to develop a non-work ethic to replace the old notion that work is good and everybody ought to do it; and in its place come up with the notion that self-fulfillment is good." 10

Mobility of society

- Where quality and character of education was once a local matter, populations are now too fluid and too mobile to permit inequities in educational opportunities. A child may spend his fifth grade in the northeast, his sixth in the west, and

seventh grade in the south; he should not be handicapped by this movement. Further, this mobility of population can create sudden pressures and crises at the local level where the final responsibility for providing an education lies.

Urbanization

- As cities grow, students and schools become concentrated and centralized, reducing the opportunities for individual development and increasing the effect of poverty and deprivation.

Fourth Concern: MONEY

Greater need for financial support

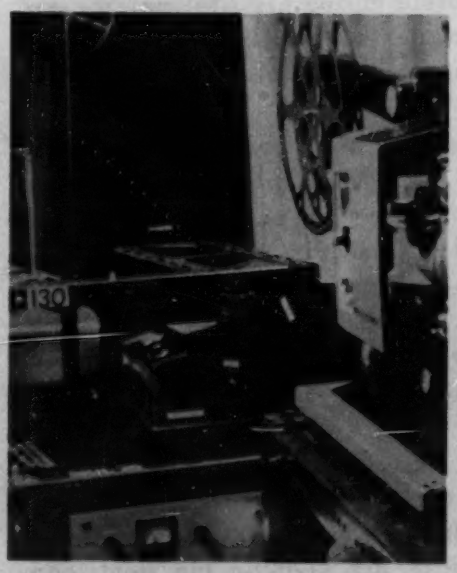
- As the educational system becomes larger and more complex, the costs of developing and operating it require a larger percentage of federal, state, and community resources than in the past.

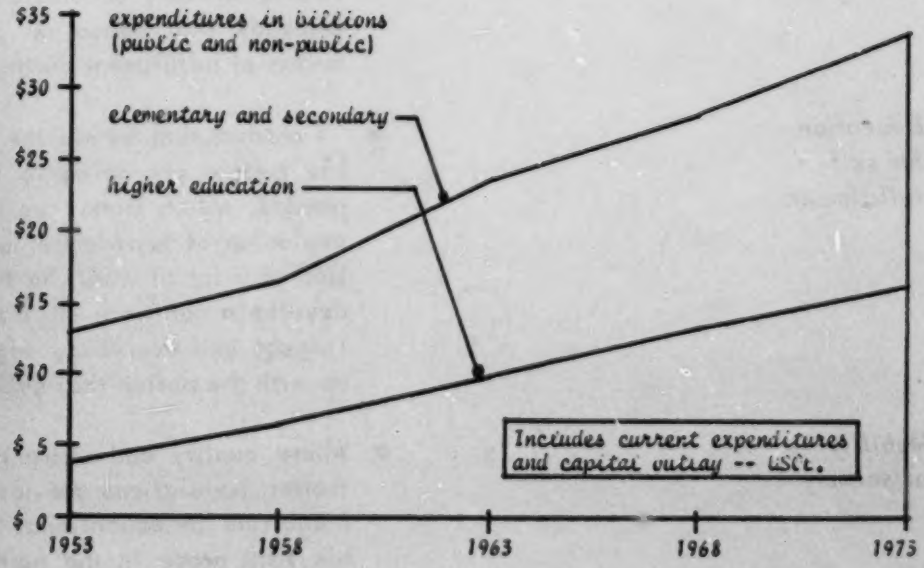
Competition for funds

- The school was once one of the major recipients of community funds. Now many other demands are made by society and government. From national defense to space exploration, the competition for funds is intense.

Accelerated antiquation

- Education as a dynamic function of society creates obsolescence within its system. More money is required to not only maintain the educational system, but for its rejuvenation and revitalization.





Responses to concerns give direction

These, then, are the concerns of contemporary education; it is the response to these concerns that gives direction to the educational system of the country. The detailed translation of these responses into curricula, methods, media and organizational patterns in turn sets the needs for school buildings.

Local direction

In response to these concerns there are several discernible directions in education today. Since education is still a local matter, all these directions are not equally apparent everywhere. To some degree, however, directions in QUALITY, EFFICIENCY, and INDIVIDUALIZATION are found in the mainstream of contemporary education. Some may feel that these, if any, are also the objectives of education.

A Direction: QUALITY

Depth and scope

- Education is providing learning opportunities of greater scope and in greater depth than ever before.

Learning principles

- Schools are educating for the understanding of principles rather than facts in order to develop a thinking population prepared to spend the rest of their lives learning.

Esthetic experience

- There is recognition of the need to develop esthetic experience in order to broaden our cultural base and to enrich individual lives.

Continuing education

- Education is assuming an obligation to treat formal schooling as a beginning rather than a terminus; continuing education is becoming a part of our daily lives. This will aid in solving problems due to technological obsolescence, leisure, and old age.

Increasing effectiveness

- Instruction is now giving attention to techniques and materials for more effective presentation of facts and experiences in order that each segment of learning be valuable and rewarding.

A Direction: EFFICIENCY

More education to more people

- Education is developing more efficient instructional processes to enable bringing more education to more people in wider range and in greater depth.

- There are increased efforts to improve utilization of expensive facilities and human talent.

A Direction: INDIVIDUALIZATION

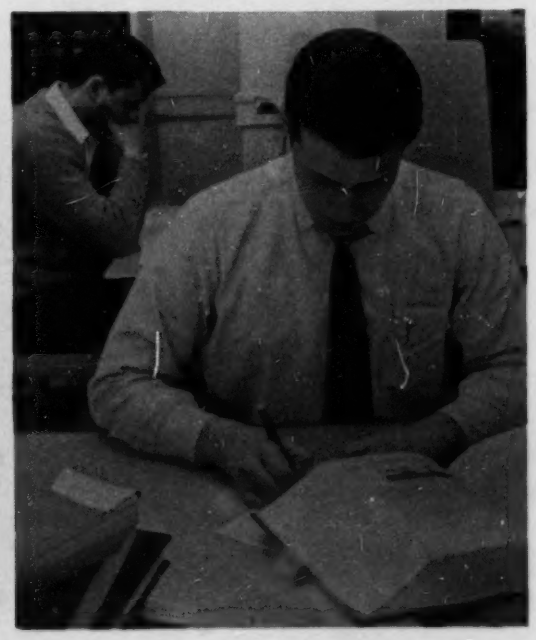
Four objectives

Four points summarize the direction of education with respect to the individual:

- Encouragement of individual initiative, responsibility and motivation, so that learning becomes person-centered rather than people-centered.
- Development of individual interests and special abilities to allow the individual to establish his appropriate and useful role in society.
- Accommodation of differing individual capacities for learning as well as social and economic backgrounds within the total framework of formal education.
- Development of a sense of personal identification and participation in the learning process, as well as basic learning skills which may be applied in personal learning and self-education.

Allow students to grow educationally

Others have identified these directions by saying, "The role of the school then becomes, in effect, a learning center, a warehouse of knowledge, a central storage bank for pupils to come and grow as tall educationally as their own potential and their own abilities permit.'[5]



Mass assembly education

"I believe we're all concerned with the present system of education that represents something akin to Detroit's mass assembly line. I don't believe it's anything like that which was conceived by our forefathers, who were trying to plan an educational system to develop people for a country that respected individuality—to train people to grow up as great individuals and to pursue knowledge."16

Now to review these responses, these directions, by reviewing innovations in contemporary education—and the role of learning media.

3 INNOVATIONS IN EDUCATION: ROLE OF MEDIA

The innovation explosion

It has been indicated that the concerns of our time—numbers, knowledge, society, and money—are reflected in the directions of contemporary education. Response to these concerns, resulting in new directions in education, are found in an explosion of new ideas, new approaches, new techniques and new learning materials. These educational innovations, the roles that media play in them, and the implications for facilities, should be analyzed by the policy-maker before making building decisions.

Discuss broad groupings of innovations

Before discussing the roles of learning media as innovative factors themselves, it would be helpful to briefly identify several significant innovations. No attempt will be made to describe the innovation in detail, except in terms of the use of media. While the number and variety of innovations are great, they can be classed in some broad groups,

- GROUPING: differentiating student groups for variety in learning.
- CURRICULA: revising curricula for individual differences.
- TIME: reorganizing the time spent in learning.
- STAFF: restructuring staff for more effective teaching.
- ADMINISTRATION: planning for effective administration.
- RESOURCES: providing students with the required learning resources.
- SYSTEMS: synthesizing the elements of learning.
- MEDIA: increasing the opportunities for learning.

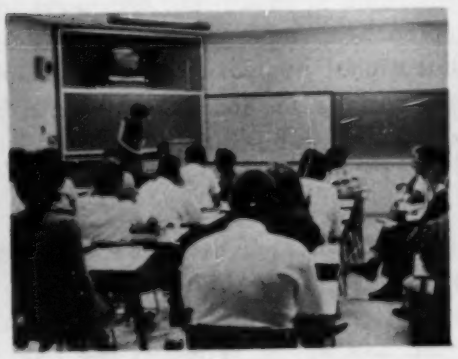
GROUPING: Differentiating Student Groups for Variety in Learning

Importance of small groups

PROJECT AND SEMINAR GROUPS. Bringing students together in small-group situations permits a variety of experiences, many of them made possible by media. They may discuss concepts presented to them in large-group or individual instruction, they may view taped lectures, see re-runs, watch demonstrations, use special media, work with models, miniaturizations, and so on.

Media used extensively with large groups

LARGE-GROUP INSTRUCTION. Whether the teacher is in the same room with the large-group or he is being presented "on-the-air", media will play a significant part in the success of the presentation. Materials must be clear, pertinent and well displayed; teachers should be able to tape and criticize their lectures and various magnification devices may be necessary. Large group instruction probably provides the greatest potential for the use of many forms of media.



Media aids multi-class teaching

MULTI-CLASS TEACHING: Through the multi-class concept a school can provide many more courses or cover several grades utilizing the same basic resources. In this kind of learning situation, a teacher may have several different groups in the same room at the same time. It is through the use of media that multi-class teaching can be made more effective. Some students may be using programmed instruction, others may be grouped around a TV monitor, while still others review projected materials.

Media production serving an entire park

EDUCATIONAL PARKS. This approach to putting many levels of education (sometimes pre-school to junior college) on the same site is gathering popularity as a means of solving many educational and social problems. The educational park gives schools the opportunity to invest in extensive media and to share them among the units in the park. For greatest effectiveness, the park will probably contain its own production and origination facilities, and a network for the distribution of resources.

Planning to combat bigness

SCHOOLS-WITHIN-SCHOOLS. Breaking down large educational institutions into smaller and more manageable "houses" or "little schools" is a common solution to the problems of bigness. Decentralization, however, focuses emphasis on networks for distributing instructional materials, and utilization of media in a variety of group sizes and learning situations.

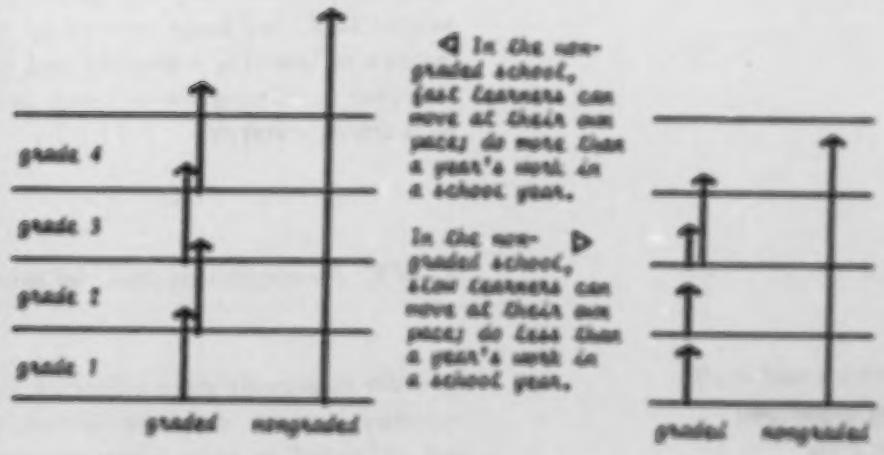
CURRICULA: Revising Curricula for Individual Differences

Allowing for individual differences.

IN GRADED SCHOOLS. Within the framework of the graded school, many attempts have been made to individualize curricula in recognition of student differences in learning rates and capacities. Many of the individual student progress plans are based on taking certain segments of instruction and allowing students to move through them at their own rates. All the attempts set aside a portion of the student's time for independent study. To implement these plans, schools are relying on various forms of media: televised instruction, cartridge films, miniaturized materials, and programmed instruction.

Media aiding nongradedness

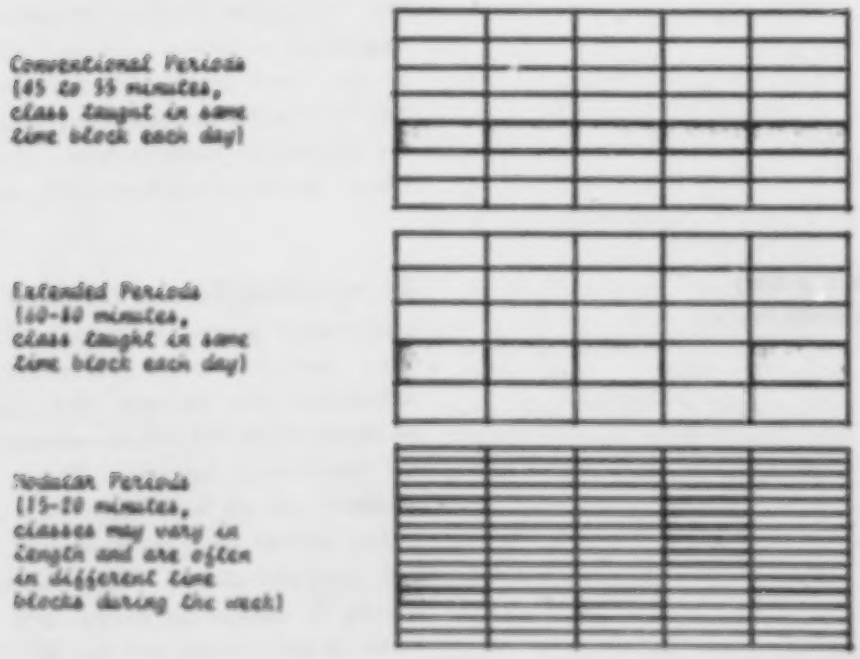
IN NONGRADED SCHOOLS. To date, the concept of nongrading or continuous progress through schools has come closest to providing truly individualized instruction. As the traditional structures of schooling (the lecture, the classroom, the period) are changed to accommodate individual progress, the roles of media and planning for media will increase. The problems of instructing and evaluating students on an individual basis, and scheduling resources, are now being solved to a great extent by the use of media, some of which are computer-based. This seems to be one of the most pronounced trends in education today, and every indication is that it will continue to gain momentum and drive.


grade 4
grade 3
grade 2
grade 1
graded
nongraded
◁ In the nongraded school, fast learners can move at their own pace; do more than a year's work in a school year.
In the nongraded school, ▷ slow learners can move at their own pace; do less than a year's work in a school year.
graded
nongraded

TIME: Reorganizing the Time Spent in Learning

50-minute period no longer sacred

BREAKING DOWN THE TIME PERIOD. As educators attempt to provide a variety of learning experiences and to individualize instruction, the traditional 50-minute time block is being changed. Some schools are extending it, others are making it into a shorter module (from which to build periods of many lengths); others are eliminating it altogether. This trend greatly complicates scheduling; some schools are using computers to straighten out the scheduling of students, teachers, facilities, and media resources. As the time blocks are further dissolved, it will be necessary to provide some learning media on a "random-access" basis.



Schools operating longer

EXTENDING SCHOOL DAY, WEEK AND YEAR. The emphases on continuity in learning and better utilization of resources are keeping educational buildings operating longer. Again, this requires easy access to learning materials and media at all times of the day, week and year. Learning doesn't stop at 3:30 P.M.; neither can the access to learning materials.

STAFF: Restructuring Staff for More Effective Instruction

Teachers and staff being organized differently

In order to provide more effective instruction, new staff organizations, echelons, teams and specialties are appearing. These approaches are reflected in team planning, team teaching and the Trump Plan.

New staff patterns have two important implications for teachers: first, they must rely on more learning media to aid them in bringing variety to instruction and to free them to become directors or counselors of learning, team leaders, etc.; secondly, they must learn to get together and plan for more integrated programs. It is becoming more and more important that teachers receive instructional "support" in the form of local production centers, regional provision of materials and services, opportunities for in-service work, and far greater access to professional resources for their own work. These new staff structures are also producing new kinds of teachers: specialists in multi uses of media, learning programmers, etc.

ADMINISTRATION: Planning for Efficient Administration

Innovations complicate administration

Nearly all innovations in education have one point in common; they tend to complicate the life of the administrator. A greater variety of student groupings, new staff organizations, schedules that change every week or every day, new facilities types, and new uses of time are forcing him to investigate new administrative techniques. Many institutions have explored computer solutions for scheduling, reporting, testing, and so on, and are, in turn, investigating the use of these computers for actual instructional uses.

RESOURCES: Providing Students with Required Learning Resources

Resources for ready use

The need to provide a "warehouse" of learning resources–books, slides, charts, film clips, tapes, media of all kinds–for the student to use in learning is a common thread winding through nearly all of the innovations in modern education. There are two aspects to the matter of providing resources. First, ways and means of producing more and more resources for teacher and student must be devised. Second, ways to recall those already-produced resources for instant use must be sought.

Developing learning materials within the school...

While there is already a great variety of instructional materials available on the commercial market, it is also important to provide the teacher and student some local means for producing materials for immediate or special uses. There must be some kind of facility in the school itself, requiring little or no supervision, where staff and students alike can come and produce relatively unsophisticated materials; many schools have done this already.

...and on a regional basis

There is also a trend toward increasing regional development of instructional aids and media. All over the country schools are making efforts to pool resources, hire more professional staff, and produce or originate materials and media for local use. Some of these regional organizations have grown into highly-structured units with a large budget and professional staff; others are just starting. New federal support will certainly lend impetus to the development of regional services.

Improving accessibility of materials

It is not enough to provide more and better learning resources; they must be made conveniently available to those who are going to use them. Our historic concept of making learning materials available in only one area of the school–the library–and forcing students to come there is changing. No longer are these materials ancilliary to learning; they are learning. As such, the student must be able to get to them quickly and easily.

"(I see the resource center) as an individual study carrel situation backed by a warehouse of knowledge with reference materials, tapes, and so forth, that can be wired into the student's study carrel. Many of these carrels will be in the resource center, but many of them, of course, will be out in various study areas. ....As we continue to grow towards greater independence in learning, we see this resource center move out into what we now call our classroom areas."5

SYSTEMS: Snythesizing the Elements of Learning

Systems analyses as a major trend

"Possibly today's major trend...is the application of systems engineering analysis to the educational process. ...Educators are beginning to realize that there is more than one way to reach desired objectives in the primary areas of logistics-the manner of presenting information to the student, and economics-the available resources, with which to accomplish this."22

Learning more than combining elements

The learning situation is far more than the mere collection of elements; it only gains real effectiveness when the elements are put together to encourage desired learning. This process of combining into their most effective patterns is called a "systems" approach. The systems concept asks: what are we trying to do? what is the best way to do it? is this the best way for everyone concerned? is it the best utilization of resources? The same questions are asked whether the preparation of a single unit of material, a sequence of of courses or an entire curriculum, are involved. Of course, the answers become more complicated as we move from simple to more complex situations.

The systems approach is nothing very new; thoughtful educators have been using it in limited situations for years. Only now, with developments in research and evaluation, has anyone been able to apply it on any kind of scale.

MEDIA: Increasing the Opportunities for Learning

Roles of media

The importance of media in designing learning which has greater opportunities for meeting objectives and which represents an effective application of systems analysis is basic. This contention can be supported by noting the many roles that media can and do play in contemporary education.

Do things that couldn't be done before...

- Media can do things–can create learning situations–that cannot otherwise be accomplished (like bringing current events into the classroom).

Present information in new ways...

- Information can be presented in a variety of ways, which best meet particular learning objectives.

...to varying groups

- By varying the medium, information can be presented to groups of many differing sizes–from individuals to national audiences–and it can be presented simultaneously to these differing audiences.

Increase effectiveness

- Media can make learning more effective by increasing the realism, the dynamics, and the emotionalism of information; it can increase the motivation to learn.

Broaden coverage

- Some media, such as television, can make the best teachers and learning situations available to more students.

Extend limitations

- They can extend the limitations of the learning situation by reinforcing and expanding the experience and background of teacher and student. In addition, they can extend limitations imposed by school plant and geographical location.

Permit industrialization

- Media can allow for individualization of curricula by presenting the same information, or variations, to different students at different times.

Releasing teacher time

- They can allow students to work under many situations without teacher guidance or supervision, freeing him for individual assistance.

Accelerate learning

- Education can be made more efficient by using media to direct information to some people in shorter-than-conventional periods of time.

Introduce economics

- Some educational objectives can be realized more economically by using media rather than by conventional means.

Examine goals

- The demands on our educational system require that every possible means of up-grading education be explored. The use of media forces educators to examine their goals and objectives more closely than before.

Educational guidelines

Before leaving this general review of educational innovation to discuss the current status and future of media, it should be recognized that several educational guidelines must be considered when utilizing learning media.

Plan for the use of media

- The educator must fully understand and appreciate the capabilities and limitations of media, and must carefully plan for their effective use.

Design learning

- The kinds and combinations of media and their duration of use should be defined in terms of desired learning objectives and by application of systems analysis techniques.

And most important at this point,

Provide proper facilities

- Appropriate facilities must be provided and must be carefully designed to permit effective uses of media within the broad spectrum of education.

INNOVATIONS IN EDUCATION - A RANDOM LISTING

Grouping Students

Frequent regrouping
Variations in grouping
Independent study and projects
Small-group study and projects
Large groups in single lecture spaces
Large groups in multiple spaces
Large groups via radio and television
Flexible groupings
Multi-age and multi-class groupings
Stay-at-home learning
Pyramidal groupings
Little schools and schools-within-schools
Redeployment plans
Educational parks
Middle schools

Designing Curricula

Homogeneous and heterogeneous tracking
Independent learning
Elective sequences
3- and 4-track plans
Core curricula
Enrichment programs
Nongrading and continuous progress methods
Home study and correspondence courses
Job retraining
Special programs for the gifted, disabled, handicapped, and culturally-deprived
Continuing or broadening education
Pre-school programs
Learning systems analysis
Cooperative "work-learn" programs
Regional curriculum development projects
Curriculum study groups (PSSC, SMSG, etc.)

Organizing Time

Accommodating variable groupings
Individualized scheduling
New scheduling cycles
Extended and modular class periods
Frequent or continuous rescheduling
Student-planned class periods
Extended school day and week
Evening courses
Summer school remedial and enrichment programs
Full school year
Trimester and quartermester plans
Co-operative "work-learn" plans

Utilizing Staff

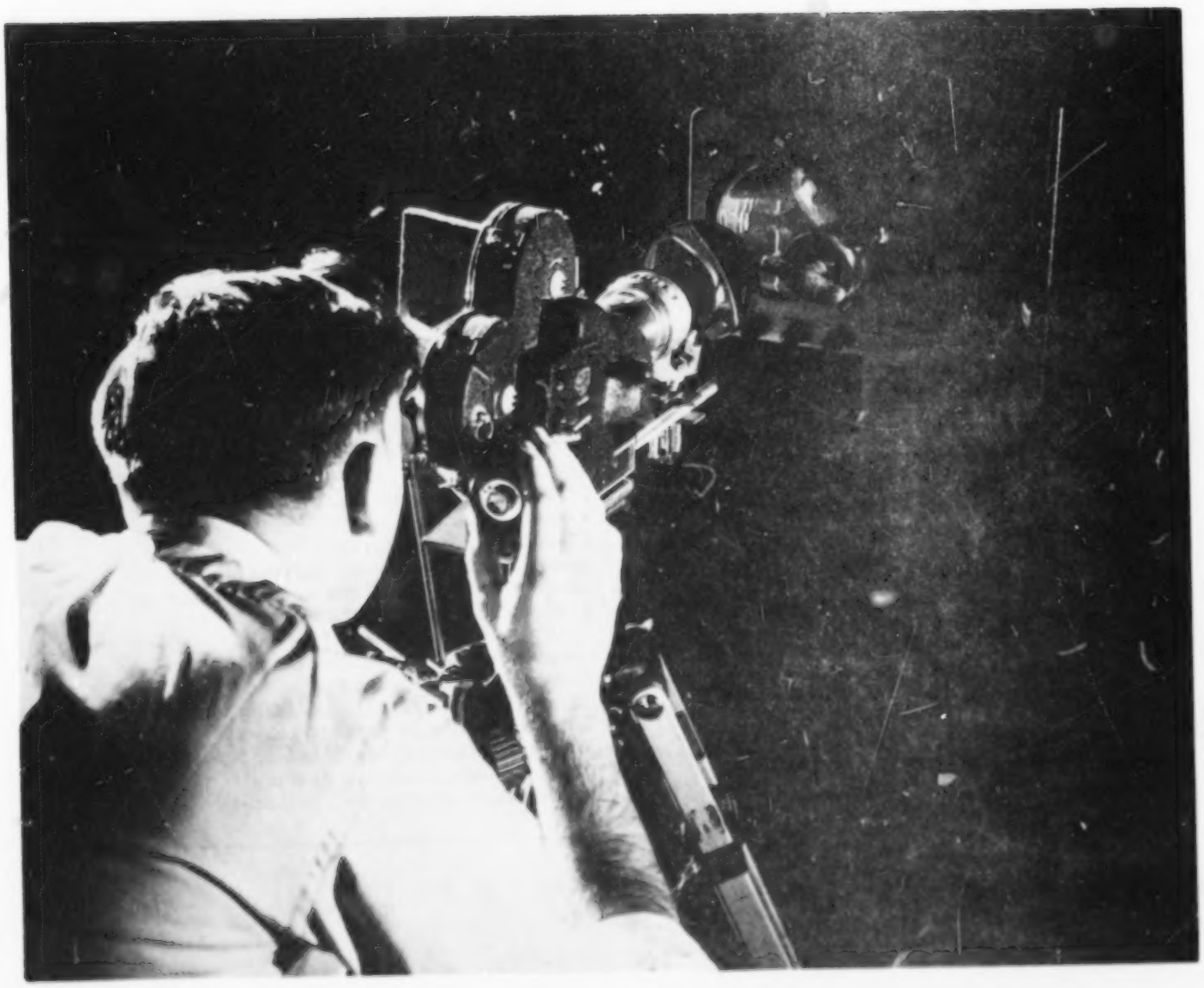
Team planning and teaching
Discipline-oriented teacher teams
Multi-discipline teacher teams
Teacher cycling
In-service training programs
Echelon organizations
New teacher types and specialists
Teacher aids and assistants
Regional adjunct or supplementary staff

Improving Administration

Computer-based scheduling and registration
Automated data processing for routine work
Tracking and evaluation techniques
Automated test-scoring
Simulation models and techniques
Systems design of school administration
Regional administrative assistance
Space and resource utilization studies
Library mechanization
Computer-based requisitioning and inventory

Expanding Resources and Media

Systems approaches to using media
New types of printed and graphic materials
Programmed textbooks
New "write-on" surfaces
Audio and video recording equipment
Local, regional, international radio
Telephone and Tele-Lecture communication
Language and audio laboratories
Sound slides and filmstrips
Single-concept films
Film catridge projectors
Overhead, opaque and micro-projectors
Systems of audio and projection components
School and regional distribution systems
Miniaturized aids
Student response systems
Commercial educational television
Closed-circuit and 2500 mc television
Airborne distribution systems
Teaching kits
Computer-assisted instruction
Simulation techniques
Computer-based resource listing and handling
Regional resource collections
Regional production of instructional aids
Regional broadcast origination
Information Storage and Retrieval



4 LEARNING MEDIA: STATUS AND TRENDS

Relative impact of media

The development of learning media has certainly had an impact on contemporary education. However, the impact is relative, depending on where you sit. For the parent concerned with reading, writing and arithmetic for his child, there probably is too much television and too many movies, teaching machines and educational hardware. For the media specialist, for the person responsible for the development of media, their adoption and expansion seem painstakingly slow and overwhelmingly limited.

Statistics misleading

Certainly statistics won't tell the whole story,– the number of television sets in American schools is a poor measure of the impact and utilization of television, just as the number of film projectors sold or the number of films distributed during a school year is an ineffective measure of the real role these things play in creating better education.

Status and trends important for planning

Regardless of the problems involved, a review of current status and trends in the use of learning media is necessary to aid the policy-maker in the realistic development of a school building project. These following points have been gleaned from seminars, talks, papers, discussions, field trips and current literature.

Uses of media not yet extensive

1. In spite of all that is said and written, learning media are not being employed extensively in American Education. For every classroom with an overhead projector, there are hundreds without one. Conventional education of the "2x4x6"* variety still predominates; effective uses of media in new ways is rare. Less than 1% of our total educational budget is spent for learning media and instructional aids.

"..When we... talk to people who are emotionally involved and committed to the values that we see in the field of instructional technology, we might think that a great deal is going on in the country; we're not very realistic about how little is being done. When we talk about the efforts being made here and there, we must realize, I think, that one sparrow does not make a summer."13

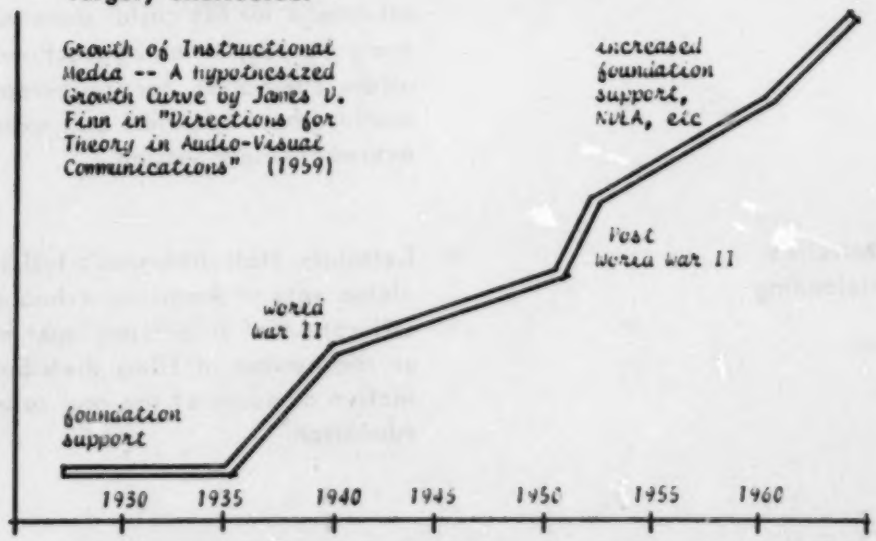
Importance of by-products

2. In spite of such small actual usage, learning media have had a surprisingly large impact on education. Investigations of their potential value have called forth curriculum studies, course revisions, redefinition of educational goals, review of the library's role, establishment of basic learning objectives, employing systems analysis techniques in designing learning and a list of other significant and healthy by-products.

More tools for teachers

3. Through learning media the classroom teacher and college professor, and the individual student, now have at their disposal an array of devices to help achieve learning objectives. For the creative and motivated teacher, this is a challenge and an opportunity; the uninspired and uncreative will remain largely unaffected.

Outside support encourages media usage



4. Federal, state, and foundation support and industrial promotion have brought the use of learning media to present status. Nothing indicates that such support and promotion will be withdrawn; if anything, they are being expanded. However, without such incentive it seems doubtful that American education would have espoused learning media as extensively as it has.

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*2 covers of the book, 4 walls of the classroom, 6 periods of the day.

Media not taking over

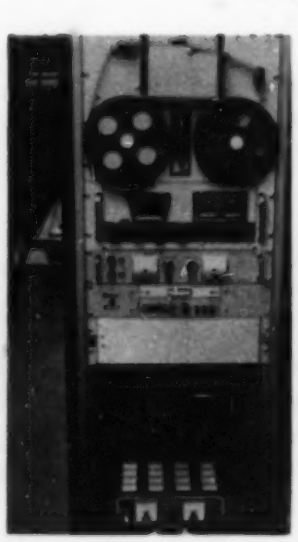
5. The use of learning media is not "taking over" education; teachers will not be replaced by technology. Media broadens the spectrum of education; they do not, of themselves, provide an education. Even the most media-oriented educators recognize limits and valid restrictions, and are simply trying to establish the most appropriate roles for media within the total educational process.

Logistic impediments to use

6. The teacher interested in using media today is faced with some real burdens – complicated and costly equipment, poor maintenance, inadequate supply of parts and replacements, immobility of equipment, lack of technical assistance, and improper facilities. Add to this the problems of finding the assistance and the time to learn to use media well; it is surprising that teachers and professors use media at all. These basic logistical problems must be solved school by school, teacher by teacher.

Segmented approach to media

7. Utilization and administration of media are often fragmented; in fact, the development of media has been a history of audio-visual cults. An integrated, multi-media approach has only recently been recognized as significant for success.



At last the film makers, the television specialists, the graphic artists, and the others are being brought together physically, administratively and philisophically. This is the first requisite for a systems approach to learning and for significant multi-media usage.

Systems concept with the proper administration

"We're going to have to get away from a fractional approach to media in which the library and its book materials compete with other components for budget, recognition and attention. The systems concept, which cuts across existing boundaries and brings all major operating systems into one functional organization, is what education is going to adopt. I think we're going to find that all boundaries between media units –

library, TV and radio, A-V, graphics, etc. – are going to be cut across, and all media units are going to be brought together. The reason, I think, is obvious. All of these media units exist for a common purpose, – to provide the materials, the services, and the skills so that effective teaching and learning may take place."25

Selection of equipment

8. The amount of hardware available, the types and variations in equipment and the number of functions they can perform, are increasing and will continue to increase at a rapid rate. Unfortunately there is a tendency in selecting instructional equipment to overlook the need for matching the electrical characteristics and interconnection provisions of "hardware" items. Thus, in many instances a school may find itself in possession of an oversupply of mutually incompatible items and will lack the facilities needed to implement its overall instructional program.

Staff members responsible for the selection of instructional media hardware must keep themselves fully informed concerning the availability of equipment and components of interest to their institution. They should be fully qualified to match product functions and performance capabilities of equipment with requirements for achieving learning. In turn, industry will become more responsive to the needs of education as education becomes a major market for hardware.

Single, versatile distribution system

9. The greatest need is the development of a single, economical system for the distribution of good quality audio and color video. When such a system is available for inter-connecting facilities in buildings, between buildings, and between institutions, then the ready availability of resources will become reality. The input for such a system must be highly flexible to include three dimensional, moving and still materials; the output or reception must be equally appropriate for individuals, small groups, and large groups.

Significance of recording devices

10. There is now a variety of audio-video recording devices. When these become completely dependable, inexpensive, and available for color, then some significant changes in technique and methods can be realized. No longer will live demonstrations in the sciences be necessary; finally the benefits of the field trip can be realized without the problems of moving large numbers of students away from the school; and broadcast television will become useful at the school level through recording and local use at appropriate times. Each independent school and teacher will be able to structure the use of mass media to fit a particular system of education.

Equipment of individual use

11. Equipment will be perfected and economically feasible for making media available for learning on an individual student basis. Films, tape, and slide materials will be as easily used and as inexpensive as printed books. This will bring together the two most significant trends in education – individualized instruction and use of learning media.

People to do things for themselves

"If we are talking individualization seriously, we will, of course, put all the materials under the total control of the individual. All these new systems anticipate making it completely possible for people to do things by themselves. Otherwise, individualization doesn't mean anything when you translate it into principles for media development."3

Teachers better prepared

12. The future should see the classroom teacher better prepared for and more sympathetic toward the use of media in day by day instruction. Schools of education will revamp or broaden their curricula, more in-service programs will be provided, and the teacher will find wide professional acceptance of media.

Development of media specialists

13. Because of the intellectual challenge and potential creativity necessary to meet the challenges of media in education, a specialty group of educators will develop which is highly skilled and highly motivated in their uses. These persons will be more than technicians; they will be media-pedagogists who will plan and design learning situations that will bring the greatest value from media. These specialists will be supported, as will all teachers, by technicians knowledgeable in hardware, its operation, maintenance, and repair.

The supporting team

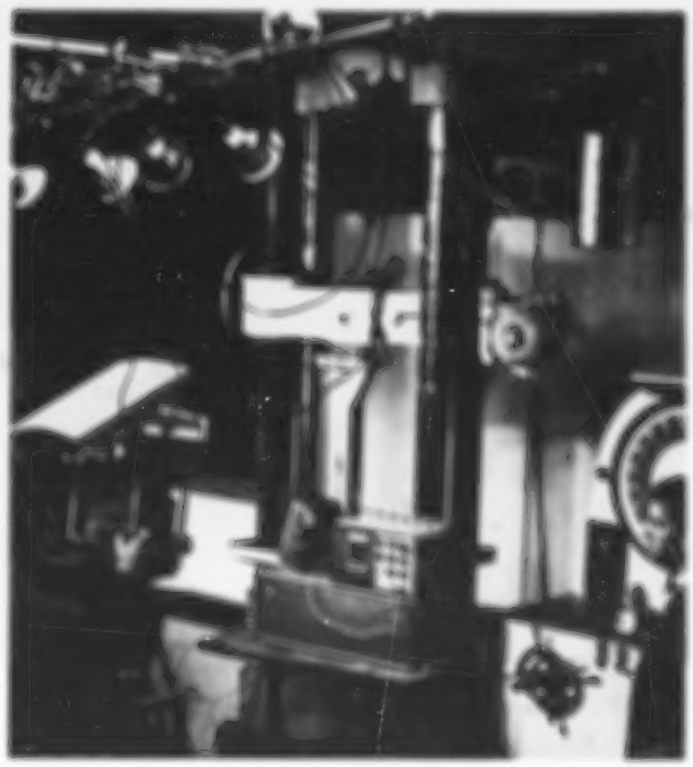
Rounding out the supporting team will be the production specialists well versed in effective television production, film making, graphic production, programming, audio recording and radio.

Information retrieval systems

14. In response to amassing information and the uses of media will come economical systems for storing and calling up information. However, these systems will be developed and will become practical only for information for which there is great demand. It is inconceivable that there will ever be a time when all information, regardless of remoteness and limited application, will be readily accessible through high speed retrieval systems. Dial-up systems for desired information are coming, but the information dialed will be of the "ready reference" type.

Practical limitations to retrieval systems

"We've been reading a lot of things lately by people who propose complex systems of dialing so that the student will be able to sit in his carrel and have access to any recorded information that he needs, simply by dialing it. If you analyze it, though, this becomes a very complicated production and design problem. Let's say that there are maybe 2,000 items – tapes, films, etc. – to which a child in a carrel should have access. The ideal thing, and I think what many of us assume when we think of an ultimate dial system, is to have an infinite number of information sources all in operating mode all at the same time. This is an impossibility. There will have to be compromises all along the line to make this kind of system practical." *7*



Media used in many ways

15. Information in many forms will be available for use in many different kinds of learning situations. The current emphasis on the learning resources center has created a new concept of use. In addition, media will be used in case studies, in seminars, in laboratories, in shops, in recreational areas, and in the many specialized facilities that make up the school and college. They will be available for learning of many types and variations, and will not be restricted only to mass instruction or independent study.

Role of research and evaluation

16. If any one development is necessary in media, it is the expanded use of a systems approach for the design and planning of learning to enable using media in the most creative and beneficial way. This implies extensive educational research and evaluation (possibly some of our great data processing potential can be turned to analysing the results of experimentation), and equipment developed in response to need based on extensive research in the uses of media. Some such research must occur in the teachers colleges in order for them to establish a forefront role in education.

Costs of media

17. And what about the costs of educational research and development? Some find them prohibitive and impeding. Others feel more optimistic.

"We talk about the cost. We have perhaps two million students taking ninth grade algebra, in our country. If we could devote $1,000,000 to developing an instructional system for the best possible method we can design for teaching algebra, we could amortize this cost at $1,000,000, just to take a rough figure, at 50¢ per student in only one year. Think what we could do with 2 or 3 or 4 years. So, I think our cost barriers are rather questionable."[13]

In summary, the trends indicate an expanded role for media in many more kinds of learning situations. More equipment, doing more things more economically is part of the future, as are teachers and specialists with unique roles in the development and use of media. There is also need for conscious effort in designing learning to make the most effective use of media and to develop media to meet well-established performance criteria and roles. All of these have significant implications for school building design.

5 LEARNING MEDIA: IMPLICATIONS FOR PLANNING

Implications for staff, leadership, budget and facilities

For the policy-maker who must assume decisions for both educational and building programs, the uses of media in contemporary education have a wide range of implications that he must consider at the outset of planning. These implications will affect such areas as staffing, leadership, budget, and facilities. Considering the nature of this report, more attention will be given to the last area.

Staff Implications

Staff attitudes and readiness for uses of media

It has already been suggested that the teaching and supporting staffs play a key role in the use of media. With a commitment to the use of learning media, it is up to the administrator to lead and direct his staff into the development of attitudes, skills and programs which will make the use of media effective and efficient. This may involve developing in-service programs and demonstration projects, remodeling existing classrooms, and providing support staff, technical assistance and production facilities. The administrator and staff must develop an attitude of co-operation in planning for the uses of media.

Leadership Implications

Initial leadership and follow-through

The use of media in education can only be accomplished through strong and thorough educational leadership. The administrator or policy-maker must not only be willing to "get the ball rolling" but to keep it moving. More than one institution has suffered the consequences of the over-zealous administrator who got everyone motivated to undertake a new approach to education, only to see it falter from lack of continued attention.

5 / IMPLICATIONS

Leadership at the local level

It is another criticism of many systems and institutions that administrative leadership becomes ineffective when translated at the local level. An all-too-common example of this can be found in many large school systems; there will be leadership at the superintendent's level, but the local "A-V" co-ordinator is a full-time teacher with a part-time "A-V" load. As a result, this key man cannot exert the necessary local leadership.

If an institution adopts a serious approach to using media extensively in teaching and learning, then the staff charged with the diagnosis and treatment of learning problems must be particularly competent. And, just as importantly, they must be given the time, the financial resources, and the facilities to accomplish this leadership role.

Budget Implications

Media reflected in operating budgets and...

As media play an increased role in education, there will be budget implications that the administrator cannot avoid. The cost of materials and equipment will assume a larger share of the operating budget, and budgets are going to have to become "flexible" enough to allow for research, evaluation, and change. Likewise, hardware and facilities and will need continual updating in the face of new developments.

...building budgets

Not only does the utilization of media imply an initial investment in hardware, and budgetary provision for change, but it further adds to the growing percent of the building dollar that goes for equipment. "I think that undoubtedly the ratio between the cost of the structure and cost of its equipment will increase on the side of the equipment. It is increasing. For a long time, you know, we thought we could equip a building for 10% of the cost of the structure, but I think that day has passed. We've got to think about financing all of this new equipment that is needed for the utilization of new media."[5]

Facilities Implications

Foolish to ignore media

It would be foolish to ignore learning media when planning contemporary facilities. Even if no immediate uses are planned, or if only minor uses are to be incorporated immediately, media will eventually be used during the life span of the building. Such future uses must be anticipated and planned; to ignore them will create handicaps and may actually prohibit the future effective use of media.

Define present and future uses

When a building program is first being considered the policymaker must define present and potential uses for media in terms of the educational program, the character of the institution, the talents and development of the staff, the type of financial support, the existing institutions throughout the region, and the interests and motivation of taxpayers, alumni, and the other influential groups. These same factors will be analyzed during the development of the building program (see Part 6 – Programming) but they must be considered initially in terms of learning media utilization

Provide facilities based on analysis of use

Once the basic analysis of the role of media has been established, it is then necessary initially to provide facilities which 1.) will support media use, 2.) will provide an appropriate environment for education, and 3.) will later adapt and change as programs and methods change.

Media usage requires special design considerations and...

The planning of school buildings in which media are to be used requires great care in the detailed design and equiping of facilities. Every aspect of the total environment of a space is more critical when it is planned for effective use of media. Lighting, acoustics, seating, shape, color, display surfaces and equipment controls all demand special attention when they make up a learning environment with media. In fact, it is the knowledge that spaces with media require more critical design and planning than otherwise, that has motivated the preparation of these reports.

5/IMPLICATIONS

...other types of facilities...

Also it is necessary for the policy-maker to be aware that the uses of media imply additional kinds of facilities not always found in more conventional school buildings:

...such as a variety of spaces for learning...

- A variety of spaces in which students, teachers and media can come together in varying configurations. The reason for needing a variety of learning spaces is obvious: extensive use of media impose certain limitations on facilities design, layout, and furnishings. Rather than attempting to accommodate the unique needs of large-group, middle-group, and small-group learning in a single kind of facility, it is probably advisable to recognize the uniqueness of these situations by providing a variety of facility types. "Multi-use spaces too often become multi-useless spaces." Moving students among facilities, each specifically designed to accommodate a particular learning situation, is one answer to the larger concern with "flexibility."

...planning spaces...

- A variety of planning spaces for teachers and staff. Faculties will also use these planning spaces for media preview and evaluation, as well as for coordinating and preparing instruction.

...and supporting facilities

- A variety of supporting facilities, local and regional, for the production and origination of media of all kinds. "I'm not sure that we've emphasized quite enough what the implications may be for what I would refer to as 'supporting' kinds of facilities, but our structures are going to take on quite a different character. We're going to have more space for the production, for the maintenance, for the distribution of these new materials."[26]

Details in Report B

These various types of space and considerations in their design are covered in detail in Report B – "A Guide for the Design Professions"; it is necessary here for the policy-maker to understand that not only is the design of space more critical, but different types of of space are involved when media are to be used effectively and efficiently.

Educational objectives the basis for planning

Finally, it is possible when planning schools with media, to become too concerned with the details of equipment, budget, administration, and not enough with educational programs. Any planning begins with a definition of educational purpose and intent; educational facilities and equipment are simply part of the means of implementation. Educational goals dictate school planning and design; not equipment or other details. "I think frequently we design facilities to accommodate the hardware. In visiting colleges and universities in various parts of the country, I see an unfortunate rush to get on the bandwagon and build facilities and buy TV projectors and install student response systems because it's the thing to do, even though they don't utilize them effectively or at all. We are building the spaces to accommodate the hardware rather than the students." 25

Programming translates objectives into building needs

With educational objectives defined, and methods and media established, it is the process of architectural programming that establishes the contents and character of the school building.

6 PROGRAMMING: DEFINING BUILDING NEEDS

Programming often overlooked or incomplete

There is one step in the design and building process for which the administrator and policy-maker must assume prime responsibility: the development of the building program. The development of the program is a vital task, too often incompletely considered or entirely overlooked. A truly successful educational plant can result only from detailed and complete programming.

Program describes the building in words

Simply put, the building program is a statement from the administrator translating the school's philosophy and goals into building requirements. It defines with words and diagrams the people and functions to be accommodated, the kinds of facilities needed, and their relationships to each other. The program, as a printed document, appears deceptively simple, but programming is a complex process. It involves many groups often with conflicting or parochial interests – teachers, staff, administrators, taxpayers, other "influential" groups and committees. It involves complex, often conflicting statements of goals, philosophy and policy. It involves complicated financial, political and administrative factors. It involves hard work and diplomacy. For these reasons programming is often forfeited in favor of arbitrary, but painless, decisions.

The building program gives general background...

The building program should give the architect all basic necessary information about the building he is to design. It should first include,

- A clear statement of the institution's educational philosophy, and the significance of the proposed building in the light of these goals and objectives.
- A more definitive statement of the purpose of the building, and its role in the district, the campus or the community.

- A brief description of the functions that will be going on in the building, particularly if they deviate from more historic functions.

...and specific details

In short, this background part of the building program should give the architect what might be called a "feel" for the building and its role in the educational process. From this base, it can become more specific:

- A schedule of every desired space in the building defining the types of users, number of users, functions to be housed, required square footages, necessary furniture, required equipment, and other supporting functions. All special requirements of which the architect should be aware should be included.

- A description of how each of the spaces will relate to each other and to the building as a whole.

- Analysis of how the building functions as a whole. This includes information about access, circulation, and overall servicing needs.

Educational specification and the building program

Sometimes the building program is not the single document or closely related documents implied here, but is composed of two separate entities – the educational specifications and the architectural program. The educational specs will contain the educational philosophy, purposes, and functions, while the architectural program will be the definitive statement of space types and design features.

Program is a method of communication

In any case, the building program gives a complete, concise, and accurate description of the building and all of its parts. It is the basic document upon which the architect begins his work. The architect looks at it this way; "We look to the educator to say how to teach, and what equipment to teach with, and then it's our responsibility to provide the housing – the outside limitations of walls, ceilings and roofs to control the elements – and to create an environment which is conducive to the learning process and will not stand in the way of it."29

Decisions behind the program

It is not difficult to realize why the task of developing a building program is so difficult that it is often by-passed or left to arbitrary or non-committal decisions. Its development requires many decisions, decisions which go to the very heart of the educational institution:

Types of questions

- What are the educational objectives of the program to be housed in this building, and how do these relate to the rest of the institution or school system?

- What curriculum or curriculum elements must be accommodated in the building?
- What instructional methods and techniques will be employed?
- What types of students will be housed? How many? What age levels?
- What types of staff will use the building? How will this staff be structured?
- What special services and resources will be necessary to support the educational program?
- How will learning be scheduled? How will the building be utilized? How long will it be open?
- What administrative organizations will be functioning within or over this building?
- What basic types of facilities will be necessary to carry out the educational programs?
- How will each of these items change in time, and what should be done about this in terms of facilities?

No simple answers

These are not simple "yes" and "no" decisions that can be easily made. Many hours of debate, many shades of opinion, and some calculated guesswork will enter into all these decisions, decisions that will become the basis for specific requirements spelled out in the program.

Who makes the decisions and supervises the process?

The manner in which the program is actually developed varies from school to school. Some institutions rely on an outside consultant who develops the building program, working in close contact with the faculty, staff and administration.// Some designate an administrative officer as responsible (an assistant superintendent or in larger institutions, a co-ordinator of planning). Other schools and institutions undertake the process through committees of faculty and staff. More and more schools are relying on their architect to undertake the programming as an extension of his architectural services. Perhaps a new type of specialist is needed. "We should try to prepare a new professional person, new in the sense that he will incorporate the knowledge of the educator with the insights of the architect. Such a man might very well be on the staff of every architectural firm which aspires to build educational buildings."26

While there is no "best" way to approach the problem, there are certain general principles that might be kept in mind:

Time for programming

- The programming process needs, above all, time – time to see that it is done completely and thoroughly, and represents the best work of all involved.

  "We need a willingness on the part of the faculty to become involved in the planning of facilities. Unless they have something to do with the planning from the very beginning, they will have little interest in the later stages of the facility development. All too often we expect our faculty to plan on their own time and do not allow them any extra time for this important process. These activities demand budgeted planning funds and a variety of resources."24

Involve the architect

- The architect should be involved in the programming process. Not only can he lend professional assistance and aid in the process, but by becoming involved in the early stages he will have a better understanding of the needs and problems behind the program.

  "We find, that there isn't enough time allowed for the planning process. People go without a school for years and years; then all of a sudden they want it built yesterday and the architect gets caught. If we're going to build a school in 1968, we try to get the people to start on it right now."15

Overall responsibility

- The administrator or policy-maker should assume, or appoint some one person to assume, overall direction of the process.

Involve the faculty

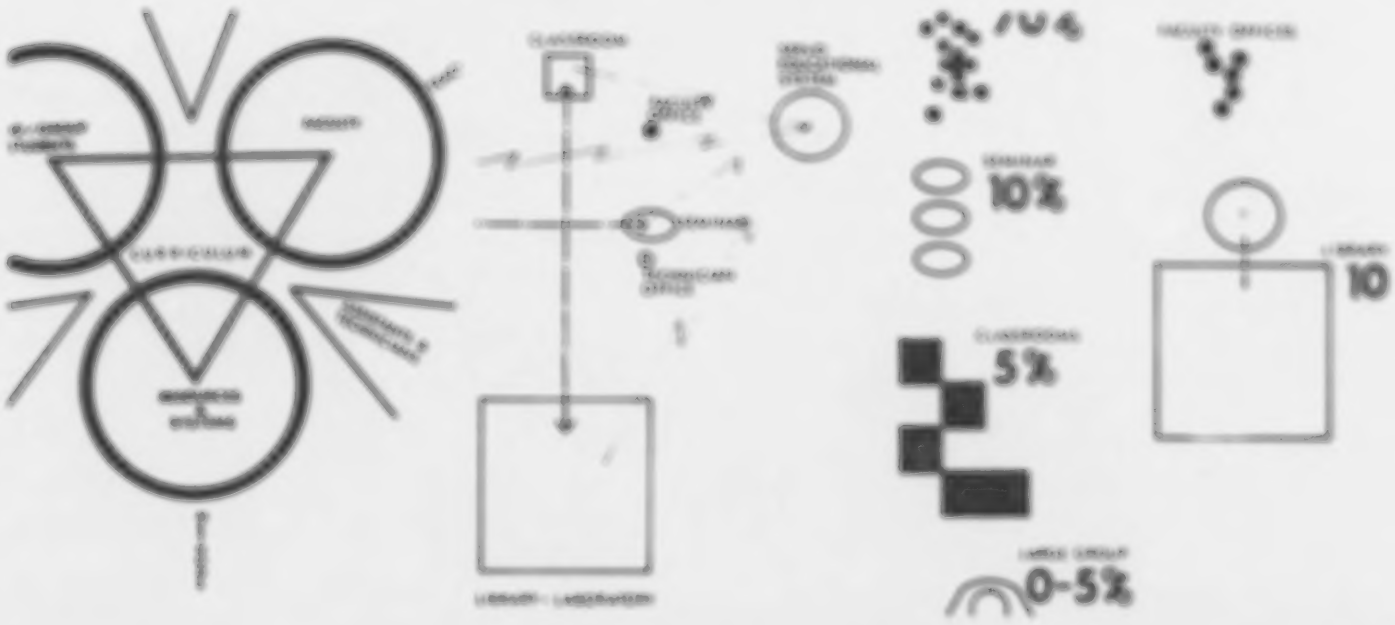
- Even though all faculty and staff will not have useful and contributive opinions, they should nevertheless be asked to state their views. This fosters a spirit of participation in the process, and will forestall many problems later; people find it hard to disavow decisions in which they had some say.

Take advantage of data processing

- Data processing and analysis should be employed wherever practical in programming. "Computer models" can simulate schedules, traffic flows, functions, operations and interactions, and can develop high levels of staff and facilities utilization. These techniques can be profitably employed to create a technically more competent document.

Programmer as diplomat and referee

Whoever is in control of the programming process will most likely find himself a mediator or arbiter among the various positions and groups. It is important that this person be extremely capable, for all too many building programs end up manifesting a very strong influence by one person or one small group to the exclusion of others involved. This is a particular problem in colleges and universities where a strong department chairman, a well-known teacher or researcher, or a person who can bring significant financial resources to the institution will often dictate the building form and contents to satisfy personal wishes or biases. When these people leave, which often occurs amazingly soon after the building is completed, the structure (or at least elements of it) are found to be unsuited to the staff and programs remaining behind.



Other uses for the program

The chief purpose of the building program is to serve as a guide and reference document for the architect during the design process. It has a number of other uses, too:

Stating objectives

- By "forcing" staff and administrators to sit down and clearly define needs, objectives are clarified in everyone's mind.

Paper changes

- The program lets everyone know what is to be built, and changes can be made ahead of time, on paper, instead of later during construction or in renovation.

Equipment list

- The program can be used for selecting and purchasing furniture and equipment early in the process.

Estimating

- By defining total areas and equipment needs, the program can give a basis for estimates and budgeting.

Policy tool

- The program can be an effective instrument for diplomacy, publicity, development, and the co-ordination of a united effort.

Program like the lesson plan

The building program is to the architect as the lesson plan is to the classroom teacher; without it, the result can be ineffective and wasteful. All that goes into any building is the best informed knowledge brought to bear by the group concerned with it. Programming is the process for insuring this transfer.

APPENDIX A

Three Meetings in May: A Resume

APPENDIX B

Educational Innovation: An Overview

A THREE MEETINGS IN MAY: A RESUME

As a means of obtaining a cross-section of authoritative opinion regarding significant current trends in education and their impact on facilities, three invitational seminars were held in Chicago in May 1964. To each of these meetings was invited a small group of knowledgeable men of recognized stature; each group represented a variety of backgrounds and viewpoints--teaching, administration, educational research, architecture, educational resources and facilities research. All of these meetings had the common objective of assessing the appropriate applications and requirements of audio in education.

Each of the three meetings dealt centrally with a different level of education: elementary, secondary, higher. This division, while arbitrary, allowed the group to determine the extent of mutual concerns, and to remain small, informal, and productive. Each seminar participant was asked to briefly respond to these questions,

1. What do you see as the significant trends in education in terms of instructional techniques and methods?

2. What roles do you see instructional aids and media playing in each of these trends?

3. What do you see as the resulting implications for educational facilities?

It was not surprising to find that similar philosophies and concerns were expressed, and similar trends indicated at all three seminars. In view of the fact that there had been no preliminary exchange of thoughts, and, in fact, no formal papers prepared, the opinions expressed were mutually supplementary and reinforcing to a surprising degree. Dozens of topics pertinent to the questions were discussed; it would be impossible to indicate in a summary the wide scope of interests expressed. The following resume, however, will serve to highlight some of the matters of chief concern and to give a brief distillation of views expressed in regard to each.

1. ON NEW THINKING ABOUT EDUCATION...

- Education is becoming a national concern. Sputnik, the new technologies and some key publications have fostered an aura of nation-wide concern for quality and broadened scope.

- More people and rapidly expanding knowledge have caused a feeling of emergency in education.

- The new technologies have shown us what we can do; now the problem becomes applying them effectively in our schools.

- The forces of automation, obsolescence and the explosion of new information is forcing us to accept education as a life-long task. Naturally, then, we want to improve it.

2. ON EDUCATIONAL ROLES...NEW AND OLD...

- Education and our schools are becoming more "world-oriented." The student must be better prepared – intellectually, socially, emotionally – for the roles he will assume in community and nation.

- Learning is becoming a part of the "fabric" of life. Schooling is no longer limited to basic training and skills; it has been extending to retraining, specialized, and continuing education.

- Our schools are extending their horizons to cover all groups – not only the average individual, but also the gifted, the unstable, the deprived.

- The school is still considered the fortress and the regenerator of democracy. Here students learn habits and work-patterns that will guide them through their everyday lives. We must ever temper our enthusiasm for change with this reminder.

3. ON INNOVATION.....

- A proliferation of innovations is the natural result of our varying educational concerns – we must find new ways of doing things.

- Innovation, however, must overcome many problems of its own. Resistance to change, lack of resources, and passive or even obstructive attitudes of teachers, administrators and even the general public are often encountered.

- The process by which an innovation is introduced may be as important as the innovation itself. Many persons may have to be "oriented" toward an innovation before it will be accepted.

- Facilities can promote and encourage innovation, but they should not be relied upon to do the total job.

4. ON THE ROLE OF MEDIA IN INNOVATION.....

- Media can play important roles in the innovation process. Certain forms may be just the ticket to make certain ideas click. For instance, neither effective large-group instruction nor effective individual instruction is wholly possible without supporting media.

- The roles for media in an innovation should be considered beforehand. If not properly prepared, the innovation may fail without having had a real chance.

- The use of media can free teachers from constant contact with students. This then allows teachers more time for planning and thinking – often about new innovation.

1. ON THE NEED TO UTILIZE RESOURCES....

- An overwhelming drive today is that of economizing on resources used in learning – teachers, time, materials, facilities. This does not necessarily mean using the cheapest or least expensive approaches however – costly persons and things can be deployed in economical, but effective, patterns.

- The use of media can often increase utilization. Its ability to accommodate different groups in different learning situations – often without the presence of the teacher – is important in this respect.

- Large-group instruction has been effectively used toward these ends. Particularly in colleges and some secondary schools, the large-group has allowed presentation of material to many students at the same time – utilizing the valuable teacher resource and the valuable time resource more efficiently. The large-group lecture also allows, indeed demands, sophisticated presentation techniques.

- Proponents of individualization consider the large-group approach out-of-place in their programs. Others claim that it can only provide one-way communication, but this can be answered with various response and feedback mechanisms.

6. ON RECOGNIZING DIFFERENCES AMONG INDIVIDUALS....

- There has been a growing recognition of the essential differences among individuals. Schools should exploit these differences rather than submerge them as we have done in the past.

- Students should have the opportunity to learn according to rate and capacity. Individual initiative should be fostered, and students given the latitude to think independently and "learn by doing."

- Responsibility for learning can be transferred from the teacher to the students – just where it belongs. Pupils, in turn, must become aware of these responsibilities.

- Independence should be offered to all students, not just the best or the most highly gifted, although not all students can benefit extensively from independence.

- Individualization places great importance on the social structure of the school. The concept of independence goes hand-in-hand with that of interdependence.

- A whole series of problems associated with individualization must be solved, however. Evaluation, marking, administration and more complicated educational planning will all be encountered.

7. ON NEW ROLES FOR TEACHERS....

- Contrary to many popular beliefs, new ideas are not displacing teachers. Many roles are changing however. The teacher is no longer merely a dispenser of knowledge, but an organizer of inquiry as well as inquiry – an inspirer and a co-learner.

- The keywords are co-operation and planning. As teachers break out of the self-contained classroom they must work, confer and plan together. They need spaces in which to do this.

- More special abilities will be required of teachers in the future. They will have to have a firm grasp on educational psychology to fit their roles as "directors" of learning.

- Schools are moving from the custodial situation to one in which students can come and go. The teacher must relinquish the control role in this process and become a teammate or – as one seminar participant put it – a physician

who is not constantly present, but always available.

- The teacher plays a key role in the use of media; this role must not be underestimated in introducing innovations which rely on media for their success.

- The new media are forcing educators to sit down and formalize learning objectives; the teacher must be willing to accept this constant "picking apart" of many time-honored concepts.

- Teachers colleges, in the main, lag far behind many developments in the field. This lag unfortunately includes training in effective uses of media.

8. ON NEW ORGANIZATIONAL PATTERNS....

- The need to break out of the 2 o 4 o 6 lockstep (education within the confines of the 2 covers of the textbook, 4 walls of the room, and 6 periods of the day) requires changes in school structure and organization.

- School programs must become flexible enough to accommodate many group sizes and types, many different learning situations.

- Administrators will need help, possibly from the computer, in working out many of these organizational problems.

9. ON COMMUNICATIONS....

- Communication is the key to learning, and ways and means of accomplishing it are changing in the 1960's.

- We are no longer tied to the "muscles of the teacher's voice box." Rather we can use learning media to bring the student into contact with a wide variety of learning experiences even without the physical presence of the teacher.

- Many of the new forms of communication are one-way, and this is not necessarily bad. Watching a single-concept film or calling up a piece of information can be accomplished effectively in this medium.

10. ON LEARNING "SYSTEMS"....

- As interest in the learning process grows, and as many different ways of accomplishing it are devised, there will be a greater need for overall planning.

- This planning will be embodied in what we are calling a "systems concept" – each piece of information to be conveyed will be looked at in terms of: how can it be best done? by whom? in what size group? using what media? in what facility? and so on.

- An important facet of the systems concept is evaluation. In too many cases we use learning media without ever analyzing them in the light of educational goals.

11. ON THE ROLE OF MEDIA....

- In general, the role of media in education is expanding. It is being considered a logical route for conveying ideas – both in the large-group situation and in individual access to information.

- As the educational market gains strength and depth, cost factors are decreasing. More media "tailored" to educational needs are coming onto the market, too.

- An increasing share of the building budget will be devoted to media and equipment as time goes on.

- Media will not replace teachers. Rather it will expand learning horizons, aid him in bringing a wide variety of learning experiences, and free him to become more of a learning "counselor."

- Even though the role of media in our schools is on the upswing, attempts to recognize its importance in our teachers colleges are less pronounced. This is a situation in need of correction.

12. ON TELEVISION ....

- Of the various instructional media in use today, television remains the most controversial. A variety of opinions – ranging from thorough acceptance to outright disclaim – were exhibited at the meetings.

- Some consider it the "messiest" of the mass mediums, a constant threat to individualization, and a convenient facade behind which we can hide our real concerns.

- Others feel that television – especially when combined with many other functions for which it is suited such as information display, data rerating, etc. – is a particularly viable medium.

- The overall feeling was that we should continue to evaluate television – and indeed any of the other newer media – not on the basis of past performance, but on the basis of what it can do in future performance.

13. ON CENTRALIZING RESOURCES ....

- The role of the school library is changing. No longer can we consider it a large repository of books, impenetrable to everyone not armed with a great deal of fortitude and implicit faith in the Dewey Decimal System. The resource center – as we are now calling it – must be a vital thing, accessible to all and easily used.

- The resource center is envisioned as serving two functions: first its historic role as the source of information for research and enrichment, and secondly, as an actual source of instruction.

- This is easier said than done. First we must revise our concept of what a learning resource is. To books and pamphlets we must add a long list of tapes, records, films, programmed texts and other media.

- We must find new ways of classifying these so they can be easily found.

- We must either make them accessible by bringing the student and teacher into the resource center, or by providing elaborate distribution channels throughout the school.

14. ON ACCESSIBILITY AND DISTRIBUTION ...

- Someone at the meetings suggested that the library "be out on the lawn where people can get to it." This does not necessarily mean that every student and teacher has to be brought into the collection of resources, however. A great deal of thought is being given to methods of distributing material.

- Perhaps educational communications in the school should be treated as a nervous system – a central repository of materials with an extensive "channel" winding through the school. This channel can be tapped anywhere by anyone.

- In any case, there is a need to find ways of bringing information to students and teachers – and to do it without delay and without expensive handling of hardware.

15. ON PRODUCTION AND ORIGINATION ....

- As the role of materials and equipment becomes increasingly important in our schools, it is important that both teachers and students be given facilities for production and origination.

- Some provision for local in-school production units should be made – here students and teachers can turn out simple teaching aids at a moment's notice.

- Many schools (and co-operatives of schools) are looking up local production units with regional centers. These regional operations can produce materials for local needs but on a more professional basis.

16. ON PLANNING AND DESIGN ....

- Most of the seminars felt that the greatest need in education today is for planning – planning on all levels. As far as facilities go, their planning should be thorough and an extension of the schools educational philosophy.

- In one of the meetings it was suggested that a school be built three times: once by the educator in his program, once by the architect in his planning, and finally by the builder in the appropriate materials. Too often we forget about the first step.

- Necessities of passing bond issues and gaining financing have too long perpetrated dull, uninspiring and institutional educational buildings. We must begin to realize that there is "something special" about learning–and it should be reflected in facilities too.

- Schools are becoming more and more a part of their community. As the school day, week and year become longer, and as the school assumes new roles in retraining, broadening and continuing education, school and community begin to form a real partnership.

17. ON PROVIDING A LEARNING ENVIRONMENT ....

- Facilities can – and should – do more than house students. The school should provide a real "climate for learning," an environment responsive to student needs and the many different tasks he performs.

- Architects and educators alike have given too little thought to what gives a building "child appeal." Why not different forms of space, different materials, different finishes that will create different sensations of experience?

- It was a prevailing opinion that each student should have a place in the school to call his own, a place to study, to keep his possessions, to receive resources, etc.

- There is need for much more research into the learning environment.

18. ON FACILITIES FOR PLANNING ....

- In our drive to provide facilities for learning, we often overlook facilities for planning. Teachers must have spaces where they can confer, discuss and plan– both privately and in groups.

- Teachers and staff should be given the same access to learning resources as is given to students.

19. ON FACILITIES FOR MEDIA ....

- The use of media has many implications for facilities – educators and architects would be wise to recognize these at the outset. Small planning changes at the beginning of a project are much more desirable – and much less costly – than major changes after the building is built.

- With respect to using media, there is often a great tendency toward the versatile space – the space that can do "many things." Unfortunately, multi-use spaces all too often become "multi-useless." Thought should be given to designing spaces that perform few functions better.

- More thought should be given to spaces for the production of aids and media within the school.

XII. ON PLANNING FOR CHANGE.....

- Even though everyone at the meetings recognized that the *only* real constant in education today is change, there are widely varying opinions on how this should be reflected in facilities.

- There is the "flexibility" camp which suggests that all partitions should go and space in the building be "infinitely changeable."

- Others feel that "flexibility" is an overworked term, a cliche which is too often used to cloud the issues or to hedge against the future.

- Perhaps a compromise – and maybe a new term, "Adaptability" – is the way to describe this essential requirement. We know things will change, and we *should* accommodate it as easily as possible. We *should* provide a variety of spaces, some expendable, with a variety of environments. We should construct our schools so these can be changed in time – perhaps from year to year – to allow for changing curricula. We should construct some of them to change from hour-to-hour, some from day-to-day.

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B EDUCATIONAL INNOVATION: AN OVERVIEW

The "innovation explosion" is a very real part of contemporary education; the administrator and policy-maker must contend with it in terms of developing programs, and specifying facilities.

The explosion of innovations has many fine aspects; it is providing educators with new ideas, new techniques, and new materials with which they can provide quality instruction and learning. Of course, not all innovations are significant, sincere, and permanent, but their overall effect on education has been beneficial.

The "innovation explosion" has raised some problems of its own in educational planning:

- Teachers and administrators are so beleagured with choices and variations that many simply avoid the matter altogether; others get confused and make ill-advised decisions.

- Many look on an innovation, or on innovations in general, as promotional gimmicks, as means to bring about false savings, or as means only to keep up with the "educational Joneses."

- Often there is the feeling that it really makes little difference which innovation a district tries as long as it tries one.

- There is widespread opinion that some groups are "buying" change, that is, contributing great sums of money without regard to basic educational values and objectives.

- Often there is genuine concern that the innovation being tried doesn't fit district needs or its educational philosophy.

- Some ideas or approaches are chosen without a complete knowledge of their implications, problems, or even basic conflicts with educational goals. Also, two innovations may be inherently contradictory; both cannot be effectively employed.

- Many a good innovation has been dropped because it was not implemented thoroughly; administrators failed to train or convince staff, only certain segments of the staff became familiar with it, or students were never prepared for it.

- The other extreme from poor implementation can cause problems, too. Getting too "gung-ho" or too involved with mechanics of a specific innovation may cause teachers and administrators to loose sight of its real objectives.

- Combinations of distrust, half-knowledge, poor implementation or over-involvement have often allowed auras of cynicism to build up around an innovation. A classic description of team teaching as "I teach ....you smoke" is typical of this kind of cynicism.

- Less-than-adequate facilities sometimes make it impossible to get a true test of new approaches.

- Means are not built into most innovations for genuine evaluation and reorientation after a period of time; as a result true results are never available to others who want to try the approach.

Some of the results of these problems have been no less than disastrous. Administrators become wary of broaching new ideas; some teachers have

been altogether "soured" on innovation in general; and many fine new approaches have been simply disregarded because of poor experiences which are no fault of the innovations themselves. Segments of the educational profession are beginning to see these problems and tackle them through efforts such as:

- Those who feel they have something worthwhile are making sure that administrators and teachers get to see it as objectively as possible; they are beginning to realize that one-sided promotion of good points while glossing over bad ones does more to hurt than to help.
- Expanded, objective coverage of innovations by educational and technical journals is also working to clear away suspicion and doubt.
- More thought is being given to thorough implementation of innovations; detailed preparation and in-service training, special pamphlets and guides, and instructional aids and media to support a new approach may be established before any actual implementation steps are taken.

Several problems remain largely unsolved, though,

- The spirit of competition among schools pushes administrators toward accepting some innovations to keep up with the neighbors and to haphazardly trying to outdo them.
- There is still a need for dissemination of results, both good and bad. It is notable that many grants available today for educational research and demonstration make little or no provision for effectively disseminating the results!
- Schools must still produce clear statements of educational policy and philosophy as yardsticks by which they can measure new ideas and approaches.
- The education of teachers still lags behind the acceptance of new approaches in our schools.
- Teachers are not given assistance and encouragement in change.
- There remains a lack of dynamic educational leadership and the appropriate administrative structures to develop, evaluate, and disseminate innovations.

The importance of this last point should not be underestimated. The answer to the problems caused by the innovation explosion does not lie wholly in dynamic leadership and administrative structures, but many feel that until these are provided, the problem will largely remain.

In a report for the New York State Education Department,* Herbert Brickell suggests what has kept education from finding appropriate ways and means for dealing with innovation: we simply do not understand the innovative process; or if we do, we have failed to translate it into the appropriate leadership patterns and administrative structures. Brickell contends that there are three phases to innovation, and that each requires special people and special atmospheres:

- DESIGN. The actual design of educational innovations requires staff with a particularly high degree of competency – the experienced educator with the appropriate wealth of knowledge and experience in his field – operating in a free, enriched, and almost artificial setting.
- EVALUATION. Accurate evaluation of educational innovations requires another

*H. M. Brickell, Organizing New York State for Educational Change, Albany, The State Education Department, 1961.

kind of person – the professional evaluator, schooled in methods and techniques for testing and analysis – operating in a tightly controlled, observed, an unfree environment.

- DISSEMINATION. Dissemination and demonstration of innovations is a wholly different matter from design and evaluation. This must be done – in order to be convincing – by "typical" teachers in "typical" settings.

Brickell's point is that these three unique aspects of the innovative process are often confused: that designers are put in evaluator roles, dissemination is left in inappropriate hands, and that too many people are required to carry out all three phases by themselves. The problem would be largely solved if educators (1) recognized the distinctness of the phases, (2) placed the proper persons in the proper roles, and (3) created the proper administrative structures.

On the latter point, Brickell suggests first, the creation of a large scale "educational research agency," perhaps one per state (or like the regional education laboratories being proposed under Title IV of the Elementary and Secondary Education Act of 1965). These agencies would sponsor design and evaluation work, and maintain close ties with local units actually responsible for disseminating the innovations. These local units (like the Supplementary Centers proposed under Title III of the same bill) would serve to bring the innovation to the people on a local scale – one center might serve a small group of districts and institutions.

Whether everyone agrees with Brickell or not, it is important that educators and policy-makers on all levels begin to give more attention to the process of innovation. Once the process is better understood, educators can begin to approach innovations with less hesitation and confusion. This clarity can, in turn, manifest itself in better-planned programs and educational facilities.

The work of the project was greatly aided and assisted by an Advisory Committee who met periodically with the staff, participated in the conferences, and reviewed materials. Those on the committee gave freely of their time and talents.

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